

U.S. Patent Application Serial No. **10/541,308**

Response filed August 14, 2008

Reply to OA dated May 14, 2008

REMARKS

Claims 1, 2, 5, 6, 9-11, 14, 15 and 18-27 are pending in this application, with claims 10, 11, 14, 15, 18-21 and 25-27 withdrawn from consideration. No amendment is made in this Response.

It is believed that this Response is fully responsive to the Office Action dated **May 14, 2008**.

Claims 1, 2, 5, 6, 9 and 22-24 are rejected under 35 U.S.C. §103(a) as being unpatentable over JP 06-041609 in view of Svilar et al. (U.S. 4,731,118). (Office action paragraph no. 2)

The rejection of claims 1, 2, 5, 6, 9 and 22-24 over JP '609 and Svilar et al. '118 is respectfully traversed, and reconsideration of the rejection is requested.

The Examiner cites JP '609 for a composition having 1.5% copper, 0.9% carbon and 0.067% oxygen, with balance Fe and inevitable impurities, citing paragraph [0111] and Table 4 of the reference. The Examiner states that JP '609 discloses mixing iron, graphite and Cu powder into a green compact and sintering the compact.

The Examiner states that JP '609 does not disclose using a copper alloy as in claim 1, and cites Svilar '118 for disclosing a prealloyed copper comprising 2-3% Fe, 0.5-1.5% manganese, and a total of 0.5-1.0% silicon and other elements, stating that these ranges overlap the ranges of the Cu alloy in claim 1. The Examiner implies that the oxygen content of Svilar's alloy would inherently meet the oxygen range of the Cu alloy in claim 1. The Examiner states that it would have been obvious "to substitute the copper of JP ('609) with the copper alloy of Svilar ('118) in order to

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achieve even better combinations of impact strength and ultimate tensile strength as disclosed by Svilar et al. ('118) (col. 2, lines 45-52)."

In traversing the rejection, Applicant first notes that JP '609 discloses a method of manufacturing an iron system sintered member, involving adding together iron powder, copper powder, graphite and an oxide powder, then forming a compact and sintering. In paragraph [0011], cited by the Examiner, 0 to 0.2% MnO or Cr₂O₃ is mixed with iron powder, 1.5% of **electrolytic copper powder**, 0.9% graphite powder, as well as a lubricant. The disclosure in paragraph [0011] specifically refers to "electrolytic copper," that is, pure copper, and there is no disclosure of, or suggestion for, use of a copper alloy.

The Examiner cites Svilar '118 as disclosing an alloy meeting the limitations of the alloy in claim 1, and the rejection is based on the substitution of Svilar's alloy for the "copper of JP '409," apparently referring to the "electrolytic copper" in paragraph [0011].

Svilar discloses a copper alloy infiltrated ferrous powder metal part. This involves an infiltrant that is copper alloyed with iron, tin, zinc, silver, lithium, silicon, manganese, chromium, zirconium or combinations thereof (column 4, lines 52-55). In Svilar, a die is filled with powdered metal, and this is pressed (column 4, lines 61-68), vacuum sintered, and this is followed by infiltration.

The copper alloy powder of Svilar is used for **infiltrating a sintered steel**, and there is no suggestion in the reference for formulating the copper alloy with Fe powder and graphite powder, mixing the powders to form a powder mixture, forming the powder mixture into a green compact

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and sintering the green compact. That is, there is no suggestion or motivation to use Svilar's alloy in a method such as that of JP '609, and no suggestion or motivation for the method of the present claims.

Note that Svilar discloses that:

“A minimal erosion infiltrant slug (SCM Metal Products' IP-204, a prealloyed copper infiltrant having 2-3% iron, 0.5-1.5% manganese, other 0.5-1.0%, lubricant 0.5%), weighing 21% of the impact specimen, was placed on top of one end of the specimen and infiltration was carried out under vacuum using the same cycle as described for the sintering treatment except that the length of time at 2050°F. was 7 minutes instead of 30 minutes.” (column 6, lines 27-34)

This is clearly a method of infiltrating a metal having a low melting point (a copper alloy powder) into an alloy that **has already been sintered**, by fusion. This is a very different method from that of JP '609, and, again, there is no suggestion for use of Svilar's alloy in the method of JP '019, and there is no motivation in Svilar to formulate the copper alloy powder with an Fe powder or the like as a raw material, and then sinter.

Applicant submits that the motivation for the combination of references as stated by the Examiner, of “better combinations of impact strength and ultimate tensile strength as disclosed by Svilar et al. (col. 2, lines 45-52),” is **not** a proper motivation for the combination of Svilar and JP '019. The cited disclosure of Svilar specifically refers to a system in which steel is **infiltrated** “in such a way that the diffusion of copper into the steel matrix is kept within a certain range” (column 2, lines 50-52). This is completely irrelevant to JP '019, in which a composition having iron, carbon and copper is prepared and then sintered.

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To summarize, JP '609 discloses only the making of alloys with electrolytic (pure) copper, mixed with Fe, carbon and other oxides. There is no suggestion in JP '609 to use any copper alloy instead of the pure copper. Svilar discloses a copper alloy, but this is used only to **infiltrate** a **sintered** Fe alloy. There is no suggestion in Svilar to mix the copper alloy with the other metals, then sinter. Therefore, there is **no motivation in either reference** to mix a copper alloy with Fe and graphite and then to sinter, and there is no motivation to substitute the electrolytic copper in JP '609 with Svilar's alloy.

Claims 1, 2, 5, 6, 9 and 22-24 are therefore not obvious over JP 06-041609 and Svilar et al. (U.S. 4,731,118), taken separately or in combination.

Claims 1, 2, 5, 6, 9 and 22-24 provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-16 of copending Application No. 10/992,466. (Office action p. 5)

The rejection is obviated by the filing of a terminal disclaimer over copending USSN 10/992,446. The terminal disclaimer papers are filed concurrently with this Response.

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If, for any reason, it is felt that this application is not now in condition for allowance, the Examiner is requested to contact the applicants' undersigned agent at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

In the event that this paper is not timely filed, the applicants respectfully petition for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees which may be due with respect to this paper, to Deposit Account No. 01-2340.

Respectfully submitted,

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Enclosure: Terminal Disclaimer over USSN 10/992,466

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